

CLAIMS:

1. A method of performing protection switching in a communications network, the method comprising:

5 a) on an ongoing basis, monitoring a raw quality measure in respect of a first path through the communications network;

b) on an ongoing basis, deciding on the basis of the quality measure whether a failure on the first path is likely to occur in the immediate future;

10 c) after deciding a failure is likely to occur in the immediate future but before occurrence of a failure, instigating a switch to a protection path through the network.

2. A method according to claim 1 further comprising:

15 providing forward error correction coding for data transmitted on the communications network;

wherein the raw quality measure is a raw bit error rate (BER) determined prior to performing error correction based on the forward error correction coding.

20 3. A method according to claim 1 wherein the first path is a wavelength channel through an optical network.

4. A method according to claim 1 wherein deciding on the basis of the quality measure whether a failure is likely to occur in the immediate future comprises comparing the quality measure to a threshold.

25 5. A method according to claim 1 wherein deciding on the basis of the quality measure whether a failure is likely to occur in the immediate future comprises determining if the

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quality measure crosses two thresholds within a time shorter than a predetermined time.

6. A method according to claim 1 wherein deciding on the basis of the quality measure whether a failure is likely to occur in the immediate future comprises comparing the quality measure to a threshold, and if the quality measure exceeds the threshold, also analyzing previous quality measures to decide whether the quality measure exceeding the threshold is likely an ongoing condition which is likely to stabilize, or a condition which will likely result in a failure in the immediate future.

7. A method according to claim 6 wherein analyzing previous quality measures to decide whether the quality measure exceeding the threshold is likely an ongoing condition which is likely to stabilize, or a condition which will likely result in a failure in the immediate future comprises determining if previous readings have changed by greater than a predetermined amount.

8. A method according to claim 1 further comprising completing the switch to the protection path before failure of the first path.

9. A method according to claim 1 wherein the protection path is a wavelength channel to be made available for protection switching for multiple channels.

10. A method according to claim 1 wherein the protection path is a dedicated path for the first path.

11. A method according to claim 1 wherein:

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instigating a switch to a protection path through the network is done for higher priority traffic before being done for lower priority traffic.

12. A method according to claim 1 wherein the quality
5 measure in respect of a first path through the communications network comprises a BER measurement for each of at least one light path making up the first path.

13. A method according to claim 2 further comprising
10 making connection routing decisions for new connection requests taking into consideration raw bit error rates collected for the network in a manner which encourages the use of links/paths with good raw BER over links/paths with poor raw BER.

14. A method according to claim 1 wherein the raw quality
15 measure is a function of one or more raw quality measures taken for light sections forming part of said path.

15. A method according to claim 2 wherein deciding on the
basis of the raw quality measure whether a failure is likely to occur in the immediate future comprises:

determining a first order derivative based on at
20 least one previous raw BER and a current raw BER;

predicting a predicted raw BER at a next time interval
based on the current BER and the derivative; and

deciding a failure is likely to occur in the
immediate future if the predicted raw BER is greater than a
25 predetermined threshold value.

16. A method according to claim 2 wherein deciding on the
basis of the raw quality measure whether a failure is likely to occur in the immediate future comprises:

determining at least one second or higher order derivative based on one or more previously measured raw BERs and a current raw BER;

predicting a predicted raw BER at a next time interval
5 based on the current BER and the at least one second or higher order derivative;

deciding a failure is likely to occur in the immediate future if the predicted raw BER is greater than a predetermined threshold value.

10 17. A method of performing protection switching in an optical communications network, the method comprising:

a) on an ongoing basis, monitoring a raw BER in respect of a first light path between components in an optical communications network;

15 b) on an ongoing basis, deciding on the basis of the raw BER whether a failure on the first light path is likely to occur in the immediate future;

c) after deciding a failure is likely to occur in the immediate future but before occurrence of a failure,
20 instigating a switch to a protection link through the network, and switching at least one service from the first light path to the protection light path.

18. A method according to claim 17 wherein instigating a switch to the protection light path is done in a sequence based
25 on priority of the services.

19. A method according to claim 17 further comprising making connection routing decisions for new connection requests taking into consideration raw bit error rates collected for the network in a manner which encourages the use of paths/light

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paths with good raw BER over paths/light paths with poor raw BER.

20. A method according to claim 17 wherein the raw quality measure is a function of one or more raw quality
5 measures taken for light sections forming part of said light path.

21. A network node comprising:

an input for receiving on an ongoing basis raw BER measurements in respect of a path through a network of which
10 the network node forms a part;

decision means adapted to, on an ongoing basis, decide on the basis of the raw BER measurements whether a failure on the path is likely to occur in the immediate future, and after deciding a failure is likely to occur in the
15 immediate future but before occurrence of the failure to instigate a switch to a protection path through the network.

22. A network node according to claim 21 adapted for use in an optical network, wherein the first path is a wavelength channel through an optical network.

20 23. A network node according to claim 22 further adapted to complete the switch to the protection path before failure of the first path.

24. A network node according to claim 21 adapted to transmit traffic of differing priorities on said path, and
25 adapted to instigate a switch to a protection path through the network for higher priority traffic before doing so for lower priority traffic.

25. A network node according to claim 21 wherein the raw BER measurements comprise a BER measurement for each link making up the first path.

26. A network node according to claim 21 further
5 comprising:

a network routing component adapted to make connection routing decisions in respect of new connection requests, the network routing component being adapted to take into consideration the raw bit error rates collected for the network in a manner which paths/light paths with poor raw BER.